Claims

1. A method for checking value documents (3) having an authenticity feature in the form of at least one luminescent substance, the value document (3) being irradiated with light (9) and the luminescence radiation (10) emanating from the value document (3) detected with spectral resolution to determine whether the authenticity feature is present in the value document (3),

   characterized in that

   a measuring vector (X) is formed from the measuring values corresponding to different frequencies and/or frequency domains of the luminescence radiation (10), and an object allocation of the measuring vector (X) to one of a plurality of given reference vectors (A_1, ..., A_k) corresponding to different authenticity features is done by allocating at least one object allocation area (G_1, ..., G_l) to each reference vector (A_1, ..., A_k) and checking which object allocation area (G_1, ..., G_l) the measuring vector (X) is located in.

2. A method according to claim 1, characterized in that the checking method has a further step for checking whether the amount ($|X|$) of the measuring vector (X) is greater than a given reference value (R).

3. A method according to claim 2, characterized in that the step of checking whether the amount ($|X|$) of the measuring vector (X) is greater than a given reference value (R) is carried out before the step of allocating the measuring vector (X) to one of a plurality of given reference vectors (A_1, ..., A_k).

4. A method according to at least one of the previous claims, characterized in that the measuring vector (X) and the reference vectors (A_1, ..., A_k) are normalized.

5. A method according to at least one of the previous claims, characterized in that the object allocation of the measuring vector (X) to one of the reference vectors (A_m) is done by comparing the measuring vector (X) with a plurality of reference vectors (A_1, ..., A_k) and/or with at least one quantity (T) which depends on at least two reference vectors (A_1, ..., A_k).

6. A method according to at least one of the previous claims, characterized in that the object allocation of the measuring vector (X) to one of the reference vectors (A_m) is done by determining the smallest difference, e.g. the smallest distance ($d(X,A_m)$) from the measuring vector (X) to the reference vectors (A_1, ..., A_k).

7. A method according to at least one of the previous claims, characterized in that the quantity (T) which depends on at least two reference vectors (A, B) is formed as a separation plane (T) between the two reference vectors (A, B), such as an (n-1) dimensional hyperplane (T) between the two n-dimensional reference vectors (A, B), the separation plane (T) separating the object allocation areas (G_A, G_B) of the two reference vectors (A, B) from each other.

8. A method according to at least one of the previous claims, characterized in that the object allocation of the measuring vector (X) to one of the reference vectors (A_m) is determined by determining the position of the measuring vector (X) relative to the separation plane (T).

9. A method according to at least one of the previous claims, characterized in that the luminescence radiation (10) is measured with time resolution on a value document (3) to be checked, whereby the comparison of measuring vector (X) and reference vectors (A, B) can be done time-dependently.

10. A method according to at least one of the previous claims, characterized in that the measurement of the luminescence radiation (10) is done only on one or more predetermined partial areas of the value document surface which can be predetermined denomination-specifically.

11. A method according to at least one of the previous claims, characterized in that the measuring vector (X) comprises measuring values of the infrared or ultraviolet, i.e. an invisible, spectral range.

12. A method according to at least one of the previous claims, characterized in that the evaluation of the measuring values takes account of a background signal ($L2$-$L1$) which does not come from the luminescence radiation (10).

13. A method according to claim 13, characterized in that, for forming the measuring vector, an amount depending on the magnitude of the background signal ($L2$-$L1$) is subtracted from the measuring values.

14. A method according to claim 14, characterized in that the amount is dependent on the magnitude of a minimum and/or maximum of the measuring values and/or a ratio of two measuring values.

15. An apparatus (1) for checking value documents (3) having an authenticity feature in the form of at least one luminescent substance, having a light source (5) for irradiating the value document (3) and a spectral sensor (6) for detecting with spectral resolution the luminescence radiation (10) emanating from the value document (3), and having an evaluation device (7) connected to the spectral sensor (6) for determining whether the authenticity feature is present in the value document (3),

characterized in that

the evaluation device (7) is designed so that a measuring vector (X) is formed from the measuring values corresponding to different frequencies and/or frequency domains of the luminescence radiation (10), and an object allocation of the measuring vector (X) to one of a plurality of given reference vectors (A_1, ..., A_k) corresponding to different authenticity features is done by allocating at least one object allocation area (G_1, ..., G_l) to each reference vector (A_1, ..., A_k) and checking which object allocation area the measuring vector (X) is located in.